# CLAIMS

1. Method for producing recombinant RNase A in *E. coli* **characterised in that** a DNA sequence is used, which codes for a RNase A of bovine origin and which is adapted to the codon usage in *E. coli*.

2. Method according to claim 1, wherein the DNA sequence is adapted to the codon usage of *E. coli* K12.

3. Method according to claim 1 or 2, wherein the DNA sequence is adapted to the most frequently used codon in *E. coli*.

4. Method according to any of claims 1 to 3, wherein the DNA sequence corresponds to the DNA sequence given in SEQ ID No. 1 or to a sequence, which is identical to at least 90% of the DNA sequence given in SEQ ID No. 1.

5. Method according to claim 1 or 2, wherein the DNA sequence is adapted regard being had to the natural frequency of individual codons.

6. Method according to any of claims 1, 2 or 5, wherein the DNA sequence corresponds to the DNA sequence given in SEQ ID No. 2 or to a sequence, which is identical to at least 90% of the DNA sequence given in SEQ ID No. 2.

7. Method according to any of the preceding claims, wherein the RNase A is expressed in fusion with a signal peptide, which directs the transport into the periplasmic space.

8. Method according to claim 7, wherein the signal peptide is the signal peptide of the alkaline phosphatase (phoA).

9. Method according to any of the preceding claims, wherein the expression of the RNase A is under control of an inducible promoter.

10. Method according to claim 9, wherein the promoter is a heat-inducible promoter.

11. Method according to claim 9 or 10, wherein the induction of the gene expression takes place at the end of the exponential growth phase.

12. Method according to any of claims 9 to 11, wherein the induction of the gene expression takes place within a period of 14 to 20 hours.

13. Method according to any of the preceding claims, wherein the RNase A forms inclusion bodies.

14. Method according to any of the preceding claims, wherein the method further comprises recovery of the RNase A from *E. coli* cells or the culture medium, respectively, optionally by means of solubilisation and refolding of the RNase A.

15. Method according to claim 14, wherein guanidine HCl is used as denaturing agent for solubilisation.

16. Method according to claim 14 or 15, wherein reduced and oxidised gluthatione is used for refolding.

17. Method according to any of the preceding claims, wherein the method further comprises chromatographic purification of the RNase A.

18. Method according to claim 17, wherein a cation exchange chromatography is performed.

19. Method according to any of the preceding claims, wherein more than 100 mg RNase A per litre culture medium are yielded.

20. Method according to any of the preceding claims, wherein more than 3 mg RNase A per gram wet biomass are yielded.

21. Recombinant RNase A produced by a method according to any of claims 1 to 20.

22. *E. coli* cell culture, which contains at least 0,2 g RNase A per litre culture medium.

23. Nucleic acid molecule, which contains a nucleic acid sequence according to SEQ ID No. 1.

24. Nucleic acid molecule, which contains a nucleic acid sequence according to SEQ ID No. 2.

25. Nucleic acid molecule, which comprises the following components in an order from 5` to 3`:

- a promoter being active in *E. coli*,
- optionally a sequence coding for a signal peptide in terms of claim 7 or 8,
- a nucleic acid sequence according to SEQ ID No. 1 or 2.

26. Use of a nucleic acid sequence according to SEQ ID No. 1 or 2 for the production of recombinant RNase A.

27. Use of the RNase A according to claim 21 in the purification of DNA and proteins.